Injury 101: Building Your Foundation in Injury Prevention

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Today's Goals

To enhance your understanding of the basics of injury prevention, and your ability to apply these principles in a community setting

What *IS* an Injury?

- Any unintentional or intentional damage to the body (transfer of energy)
- Occurring within a short period of time
- Unintentional
- Intentional
  - Assault
  - Suicide
- Predictable
- Preventable

"Accident"

Too Vague

Better: **Fall, Car crash, Poisoning**

- **Suggests lack of understanding of causes**
- **Suggests random chance, luck, or fate**
- **Suggests unpredictability**

Injury as a Public Health Problem

Injury as a Public Health Problem

- Public health's mission includes prevention, mitigation, and treatment
- The sheer magnitude of injury deaths and disability make it a major public health problem

CDC and data on magnitude of injuries nationally and in Hawaii

Rank

10 Leading Causes of Death by Age Group – 2001

Rank	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	Total
1	Congenital Anomalies 5,513	Unintentional Injury 1,714	Unintentional Injury 1,283	Unintentional Injury 1,553	Injury 14,411	Injury 11,839	Malignant Neoplasms	Malignant Neoplasms 49,562	Malignant Neoplasms 90,223	Heart Disease 582,730	Heart Disease 700,142
2	Short Gestation 4,410	Congenital Anomalies 557	Neoplasms 493	Malignant Neoplasms 515	5,297	Homicide 5,204	Unintentional Injury 15,945	Heart Disease 36,399	Heart Disease 62,486	Malignant Neoplasms 390,214	Malignant Neoplasms 553,768
3	SIDS 2,234	Malignant Neoplasms 420	Congenital Anomalies 182	Suicide 272	Suicide 3,971	Suicide 5,070	Heart Disease 13,326	Unintentional Injury 13,344	Chronic Low Respiratory Disease 11,166	Cerebro-vascular 144,486	Cerebro-vascular 163,538
4	Maternal Pregnancy Comp. 1,499	Homicide 415	Homicide 137	Congenital Anomalies 194	Malignant Neoplasms 1,704	Malignant Neoplasms 3,994	Suicide 6,635	Liver Disease 7,259	Cerebro-vascular 9,608	Chronic Low Respiratory Disease 106,904	Chronic Low Respiratory Disease 123,013
5	Placenta Cord Membranes 1,018	Heart Disease 225	Heart Disease 98	Homicide 189	Heart Disease 999	Heart Disease 3,160	HIV 5,867	Suicide 5,942	Diabetes Mellitus 9,570	Influenza & Pneumonia 55,518	Unintentional Injury 101,537
6	Respiratory Distress 1,011	Influenza & Pneumonia 112	Benign Neoplasms 52	Heart Disease 174	Congenital Anomalies 505	HIV 2,101	Homicide 4,268	Cerebro-vascular 5,910	Unintentional Injury 7,655	Diabetes Mellitus 53,707	Diabetes Mellitus 71,372
7	Unintentional Injury 976	Septicemia 108	Influenza & Pneumonia 46	Chronic Low Respiratory Disease 62	HIV 225	Cerebro-vascular 601	Liver Disease 3,336	Diabetes Mellitus 5,343	Liver Disease 5,750	Alzheimer's Disease 53,245	Influenza & Pneumonia 62,034
8	Bacterial Sepsis 696	Perinatal Period 72	Chronic Low Respiratory Disease 42	Benign Neoplasms 53	Cerebro-vascular 196	Diabetes Mellitus 595	Cerebro-vascular 2,491	HIV 4,120	Suicide 3,317	Nephritis 33,121	Alzheimer's Disease 53,852
9	Circulatory System Disease 622	Benign Neoplasms 58	Cerebro-vascular 38	Influenza & Pneumonia 46	Influenza & Pneumonia 181	Congenital Anomalies 468	Diabetes Mellitus 1,958	Chronic Low Respiratory Disease 3,324	Nephritis 3,284	Unintentional Injury 32,694	Nephritis 39,480
10	Intrauterine Hypoxia 534	Cerebro-vascular 54	Septicemia 29	Cerebro-vascular 42	Chronic Low Respiratory Disease 171	Liver Disease 387	Influenza & Pneumonia 983	Homicide 2,467	Septicemia 3,111	Septicemia 25,418	Septicemia 32,238

Note: Homicide and suicide counts include terrorism deaths associated with the events of September 11, 2001, that occurred in New York City, Pennsylvania, and Virginia. A total of 2,926 U.S. residents lost their lives in these acts of terrorism in 2001, of which 2,922 were classified as (transportation-related) homicides and 4 were classified as suicides.

Source: National Center for Health Statistics, (NCHS) Vital Statistics Systems.

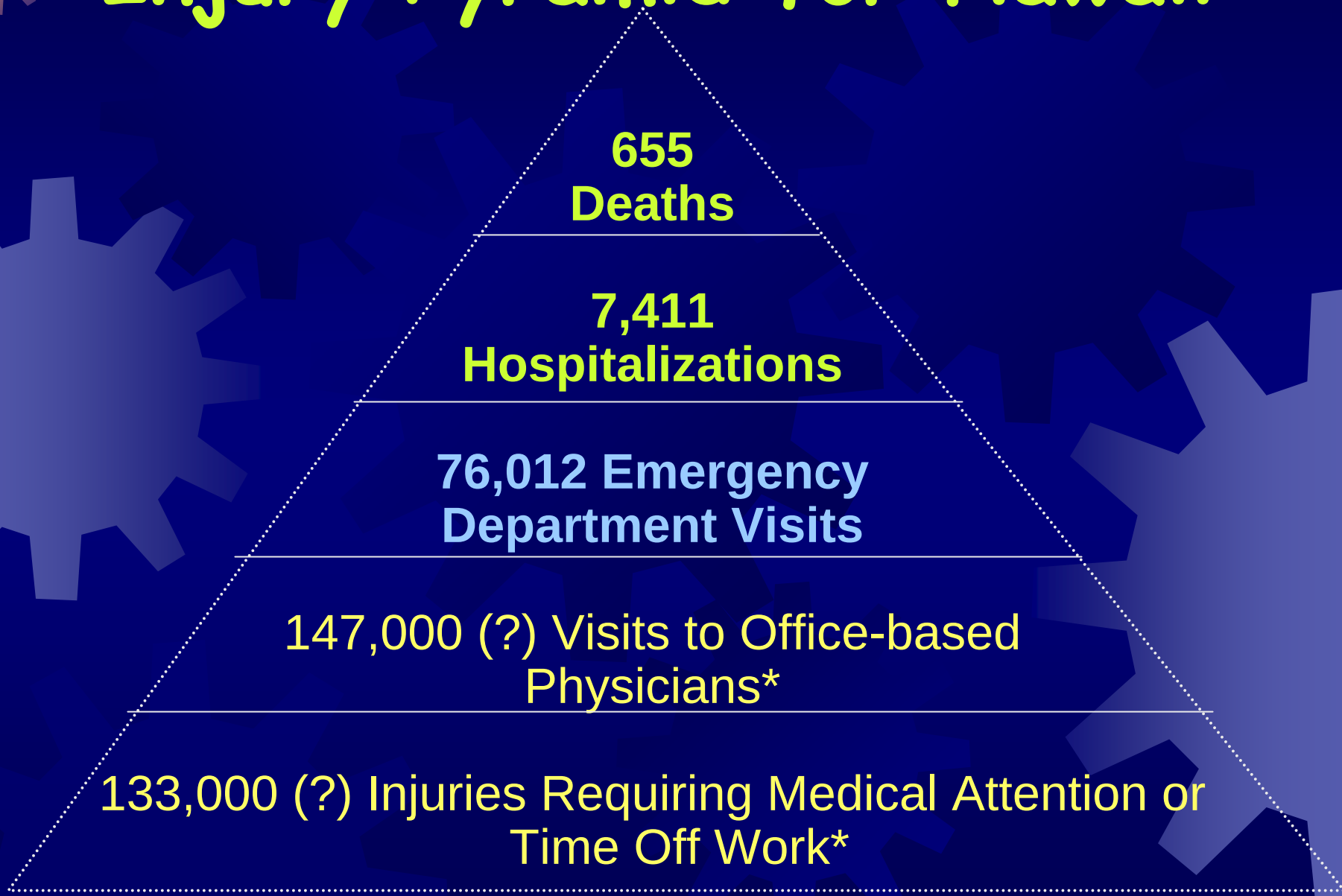
Produced by: Office of Statistics and Programming, National Center for Injury Prevention and Control, CDC.

Leading causes of death among Hawaii residents, 2001-2005.

	Age groups							
	infants (565)	1-9 y (127)	10-19 y (245)	20-29 y (558)	30-39 y (881)	40-64 y (8,871)	65+ y (32,272)	total (43,521)
1	perinatal conditions 303	unintent. injuries 34	unintent. injuries 117	unintent. injuries 224	unintent. injuries 218	cancer 2,905	heart disease 9,482	heart disease 11,852
2	congenital anomalies 79	cancer 15	suicide 42	suicide 90	cancer 144	heart disease 2,165	cancer 7,060	cancer 10,199
3	unintent. injuries 26	congenital anomalies 10	cancer 23	cancer 52	heart disease 137	unintent. injuries 605	CVD 3,197	CVD 3,680
4	heart disease 14	homicide 9	heart disease 8	heart disease 40	suicide 94	CVD 438	CLRD* 1,208	unintent. injuries 1,951
5	septicemia 12	heart disease 6	congenital anomalies 7	homicide 22	CVD 35	suicide 278	influenza & pneumonia 1,040	CLRD* 1,407

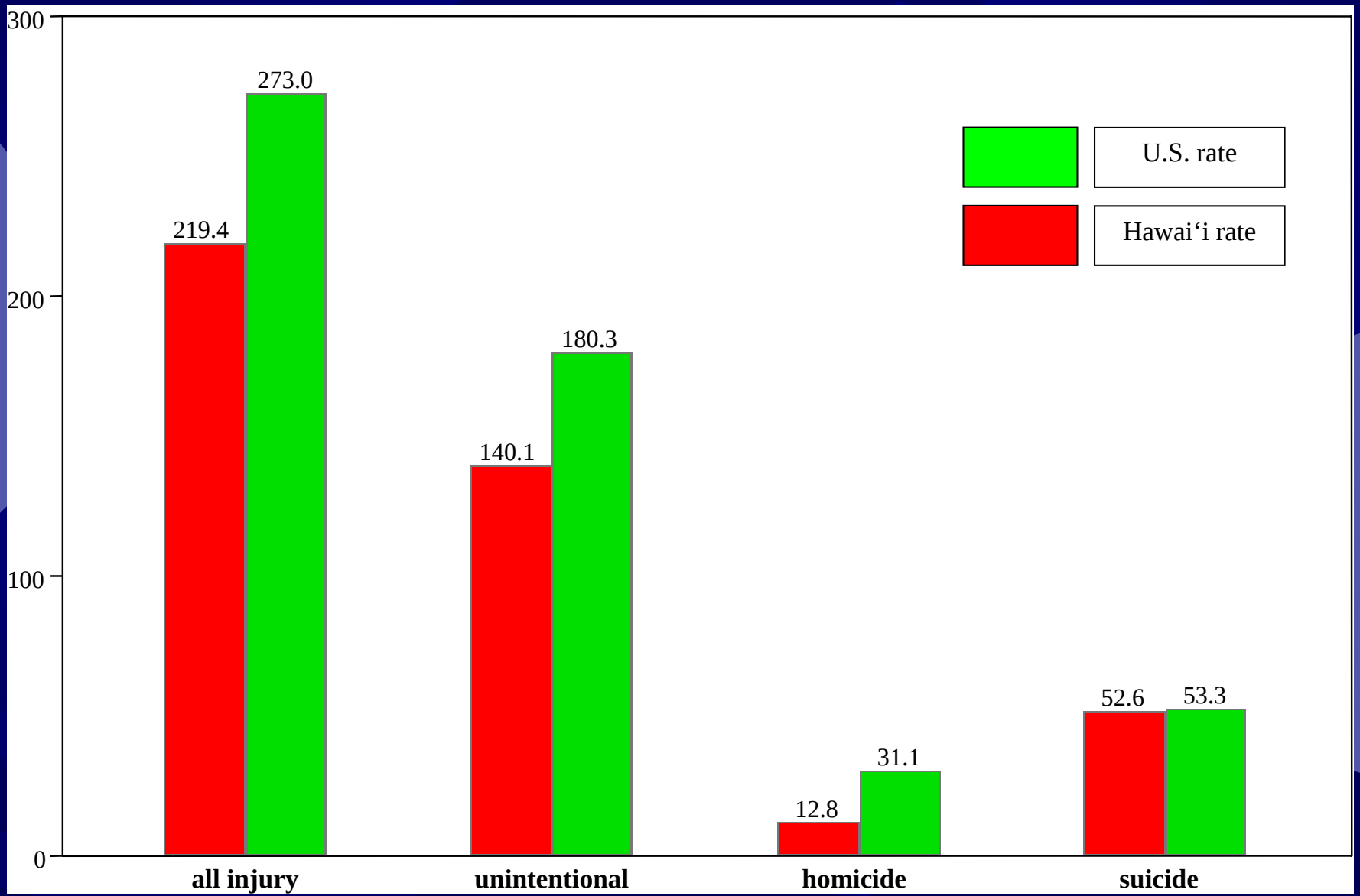
*CLRD=chronic lower respiratory disease

Injury Pyramid for Hawaii



*Estimates based on data from the National Center for Health Statistics

Fatal injury rates (/100,000): Hawaii vs. rest of U.S., 1999-2003.



Injury prevention uses scientific data!

Data Driven: defines problem

- Who is being injured?
- How is the person being injured?
- Where are the injuries taking place?
- What about the circumstances under which injuries occur?
- How severe is the injury problem?
- When are the injuries occurring?

Age Influences Injury Rates and Patterns

Childhood Injuries Are Linked to Developmental Age

Developmental Characteristics that Increase Injury Risk

INFANTS & TODDLERS

- Rapid and unexpected motor development
- Drive for autonomy
- Need to explore environment
- Cannot control impulse
- Cannot understand consequences of behavior

SCHOOL AGED CHILDREN

- Seek social and peer acceptance
- Prove self-worth by performing daring feats
- Cannot fully understand causal relationships
- Challenge parent's rules
- Try to convince adults of their competencies
- Inadequate perception of sound, movement, distance, speed

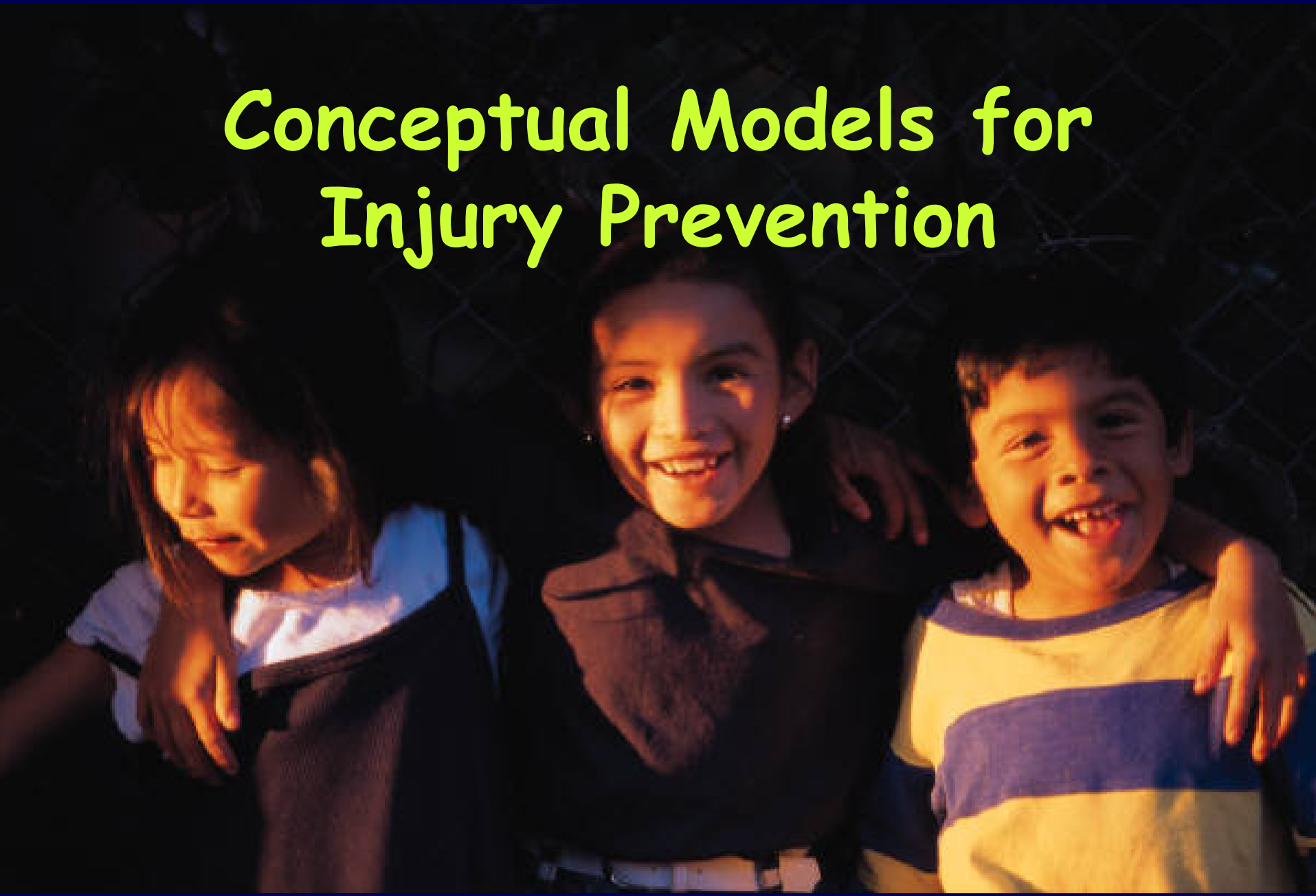
Aged 13-15 years vs. older teens

- Need for self-identity, autonomy, independence from family
- Peer-oriented
- Risk taking behaviors, need for experimentation
- Benefits of risk outweigh costs
- Perception of immortality

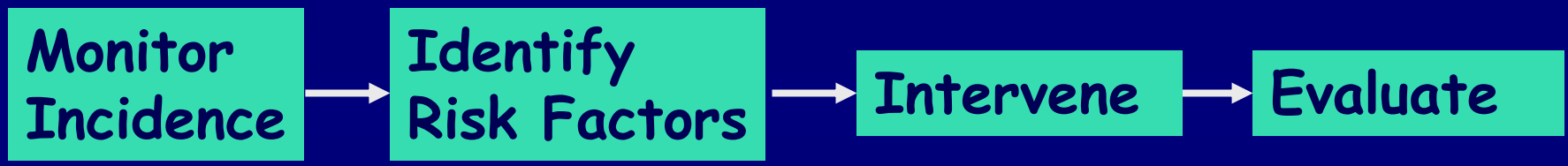
The teenage brain….. A work in progress

An NIH study suggests that the region of the brain that inhibits risky behavior is not fully formed until age 25, a finding with implications for a host of policies, including the nation's driving laws.

Conceptual Models for Injury Prevention



General Model for Injury Control

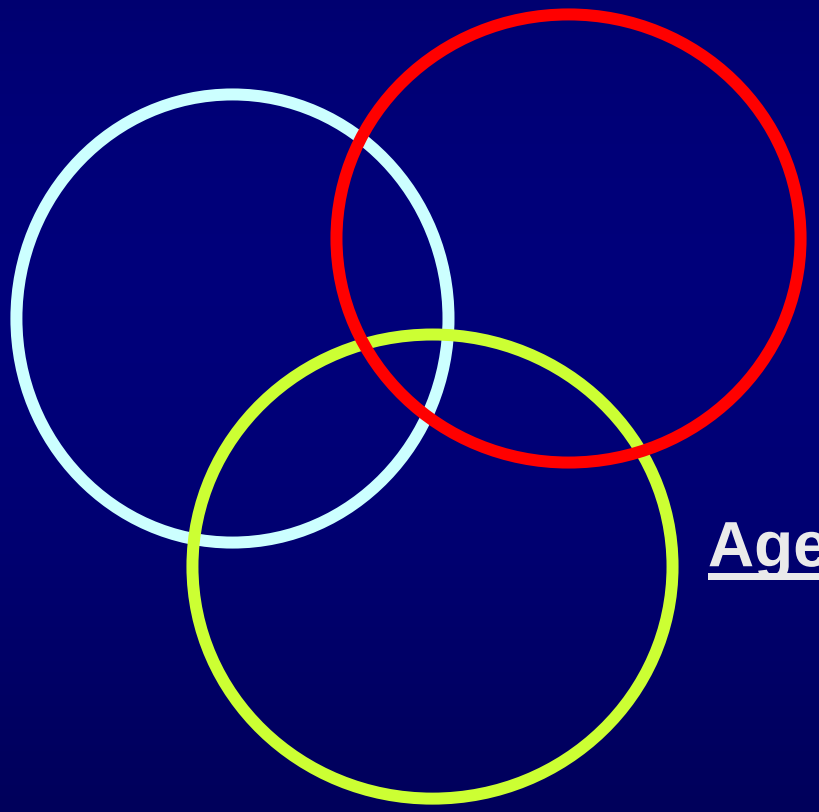


Identify
Morbidity
Mortality
Costs

Social
Genetic
Environmental

Traditional Epidemiological Model (What Causes Diseases)

Environment (places)
- Physical
- Social

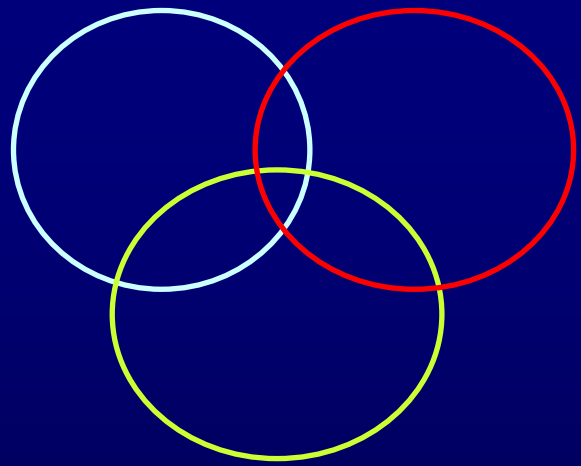


Host (people)

Agent/Vector (things)

William Haddon, Jr.

Host, agent, and environmental factors also interact over time to cause injury

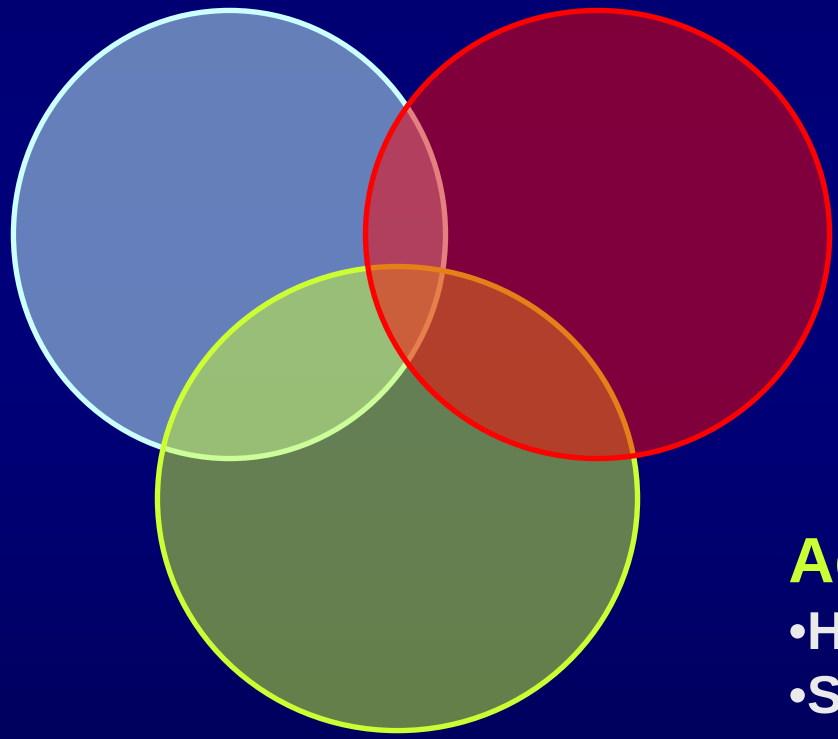


Epidemiological Model

Example: Playground Falls

Physical Env.
- Ground surface

Social Env.
- Supervision expected



Human
- Judgment
- Age
- Skills

Agent/Equipment
- Height off ground
- State of repair

Models for Developing Interventions

Haddon's Matrix

3 E's of Prevention

Spectrum of Prevention

Haddon's Matrix

(Useful tool for deciding what to do!)

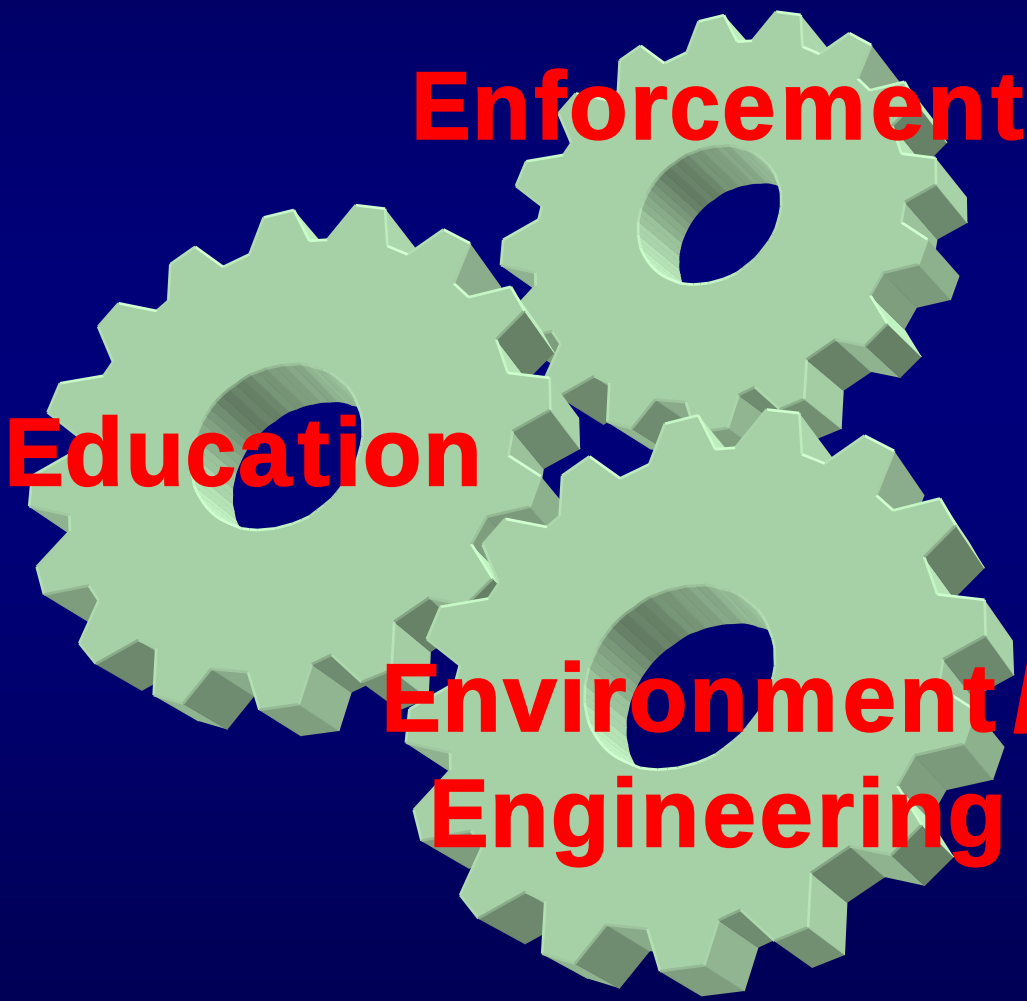
Phase	Host (Human)	Vector (Agent)	Physical Environ.	Cultural Environ.
Pre-Event				
Event				
Post-Event				

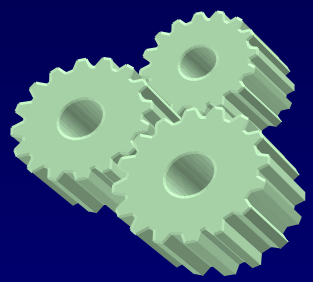
Haddon's Matrix continued

Example: Motor Vehicle Crash

Phase	Host (Human)	Vector (Agent)	Physical Environ.	Cultural Environ.
Pre-Event	Alcohol Experience Judgment	Brake status Tires	Night, Rain	Acceptance of drinking and driving
Event	Not using seat belt	No air bag Hardness of surfaces	Tree too close to road, no guard rail	Speed limits Enforcement of seat belt laws
Post-Event	Physical condition	Fuel system integrity Cell phone	Distance of emergency response	Support for trauma systems Training EMS personnel

3 E's of Prevention





Education

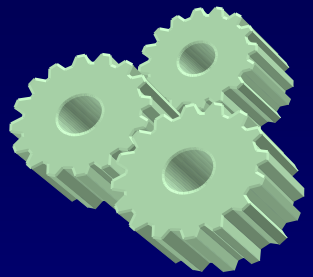
- Teach people about risks
- Persuade people to adopt safe behavior
- Inform policy makers about issues

Environment

- Make changes in the environment or product design to automatically protect everyone

Enforcement/Enactment

- Pass and enforce laws that require safe behavior

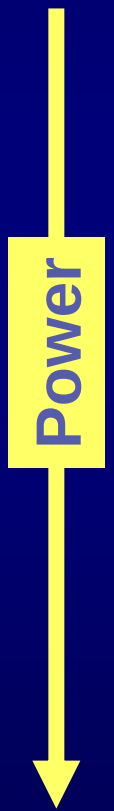


Examples of State Laws

	Prohibit	Require
Human Factors (people)	Speeding	Seatbelt use
Vehicle/Agent (things)	Speedometers registering over 80 m.p.h.	Specified maximum window tint
Environment (places)	Rigid barriers within specified distance of roadway	Break-away sign posts, soft bridge rail end points

The Spectrum of Prevention

7 levels at which prevention activities can occur:



Strengthening Individual Knowledge and Skills
Promoting Community Education
Educating Providers

Fostering Coalitions and Networks
Mobilizing Communities and Neighborhoods

Changing Organizational Practices
Influencing Policy Legislation

Prevention Institute
Putting prevention at the center of community well-being

Example: Fences for Backyard Pools

Data: 2-year-old boy toddlers at highest risk

Level 1: Educate older sibs and parents

Level 2: Summer Campaigns

Level 3: Educate pediatricians, realtors, contractors, building inspectors

Level 4/5: Drowning prevention coalitions

Level 6: Work on building permits

Level 7: Local ordinances & state law

Injury Prevention Success Stories

SUCCESS -
Poison Prevention Packaging Act

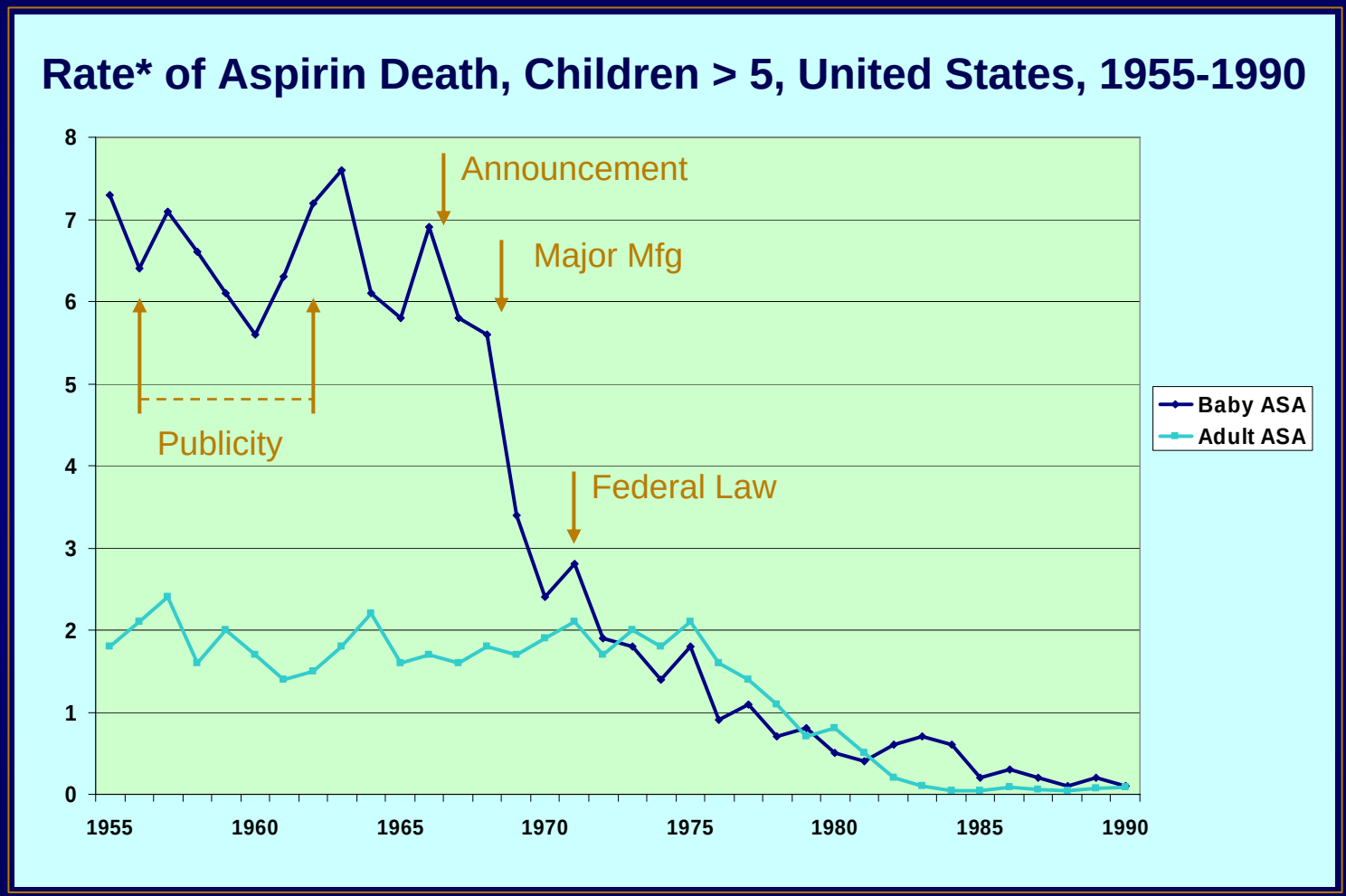
45% decrease in poisoning deaths

Why?

child-proof containers

Packaging in non-lethal doses

Place A Barrier Between the Hazard and the Potential Victim: Child-Resistant Caps on Baby Aspirin



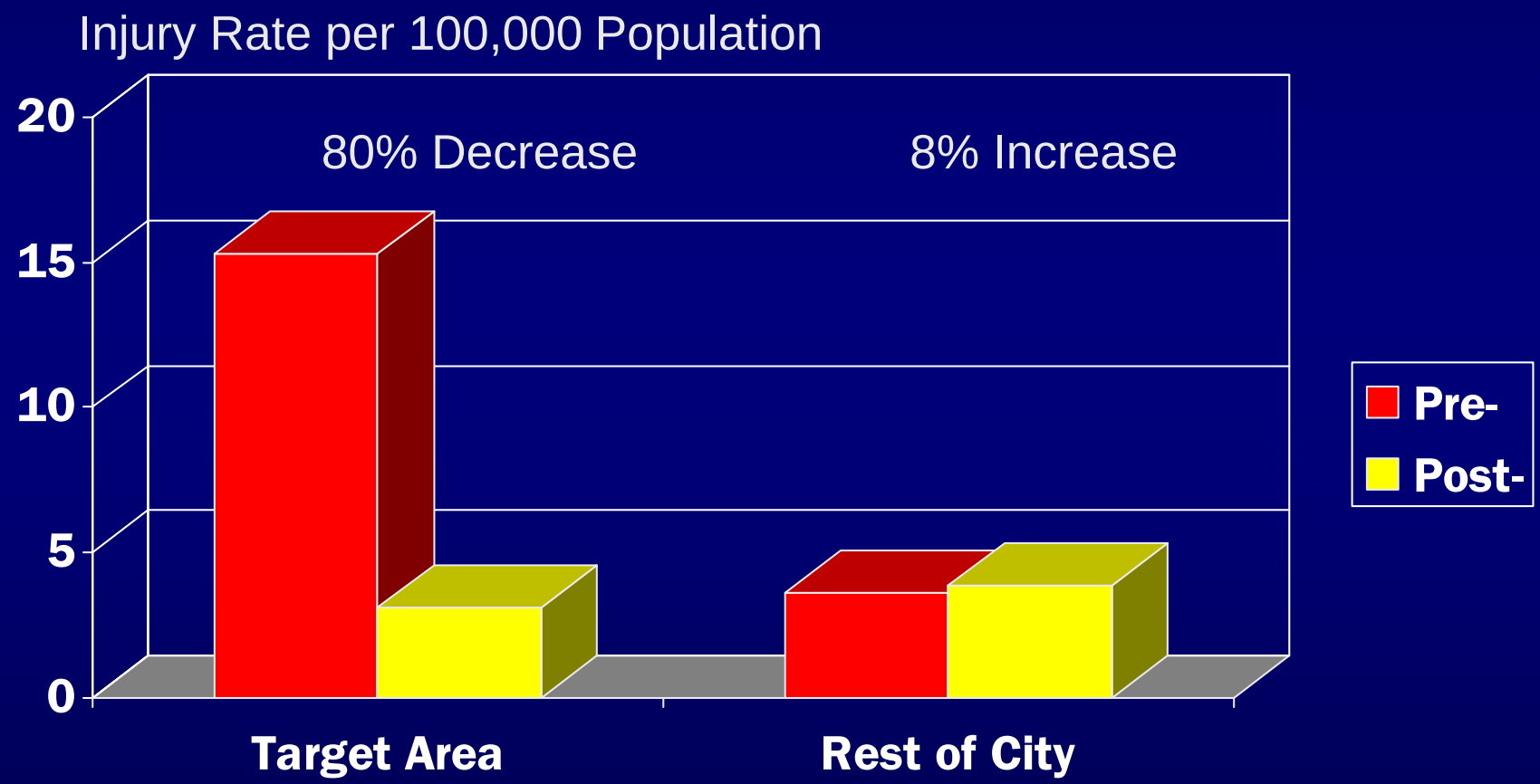
*Per million children

Sources: Clark & Walton, Pediatrics, 1979; Rogers GB, Arch Ped Adol Med, 2002; NCHS Vital Records

Success - Residential Fire Injuries

Smoke Alarm Distribution Programs Save Lives

Outcome Evaluation Per 100,000 Population Oklahoma City, May 1990-April 1994*



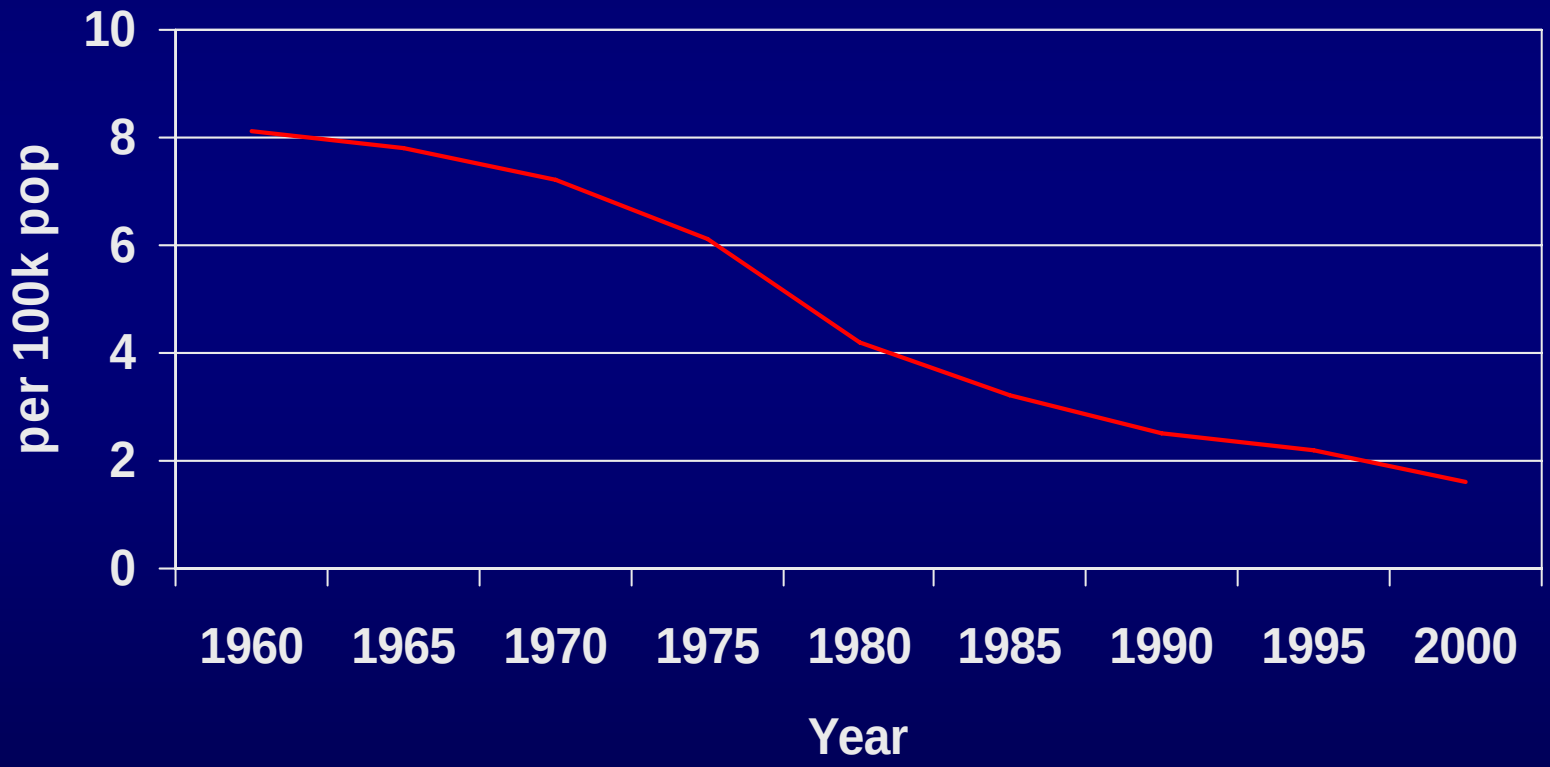
*NEJM 335:27-31, 1996

Success –
Car Seats and Booster Seats

"Correctly installed and used child safety seats reduce the risk of death by 71%, hospitalizations by 67%, and minor injuries by 50%."

Source: American Academy of Pediatrics

Occupant Fatality Rates, Infants, United States 1960-2000



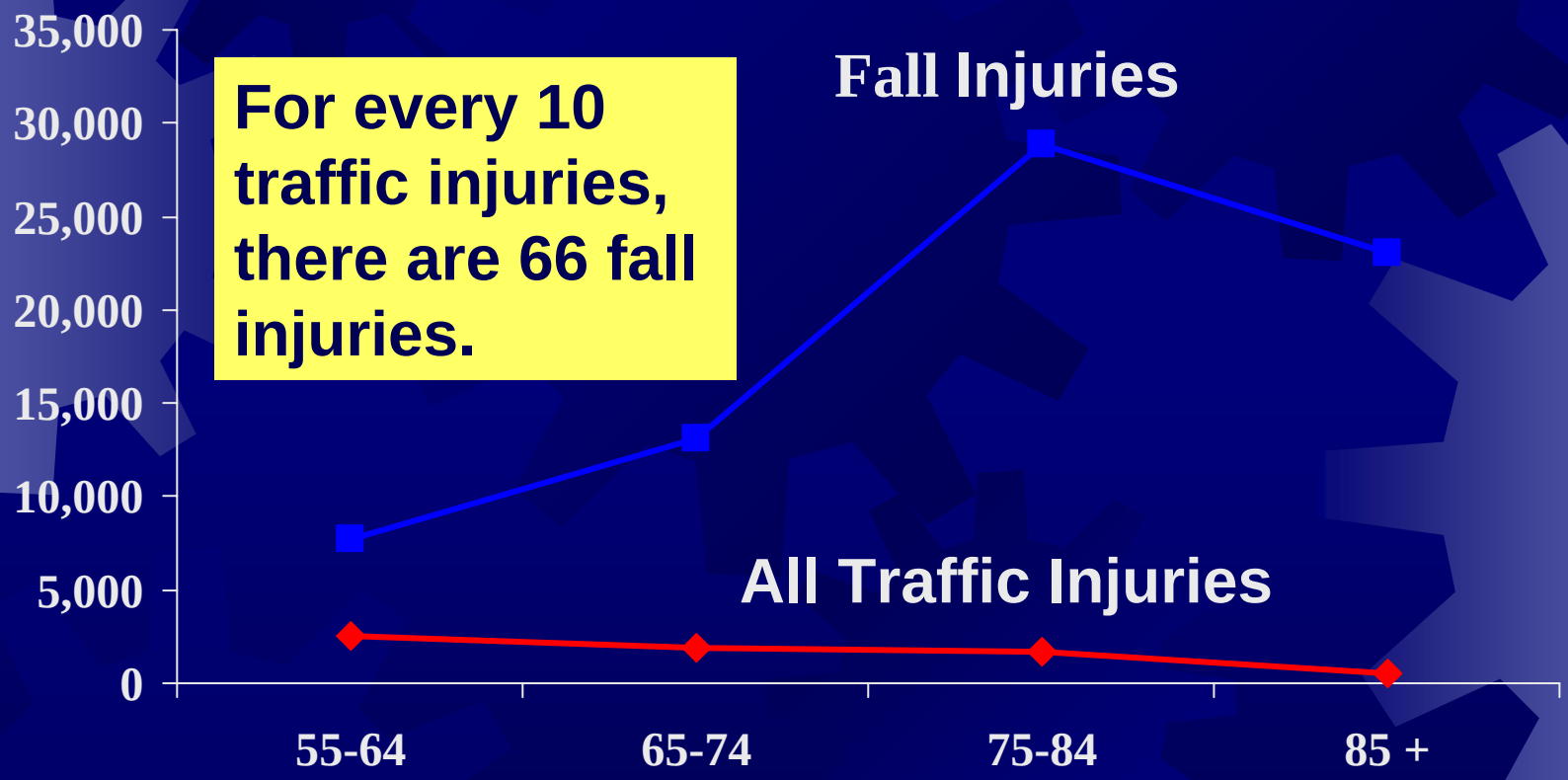
Not yet a success story…

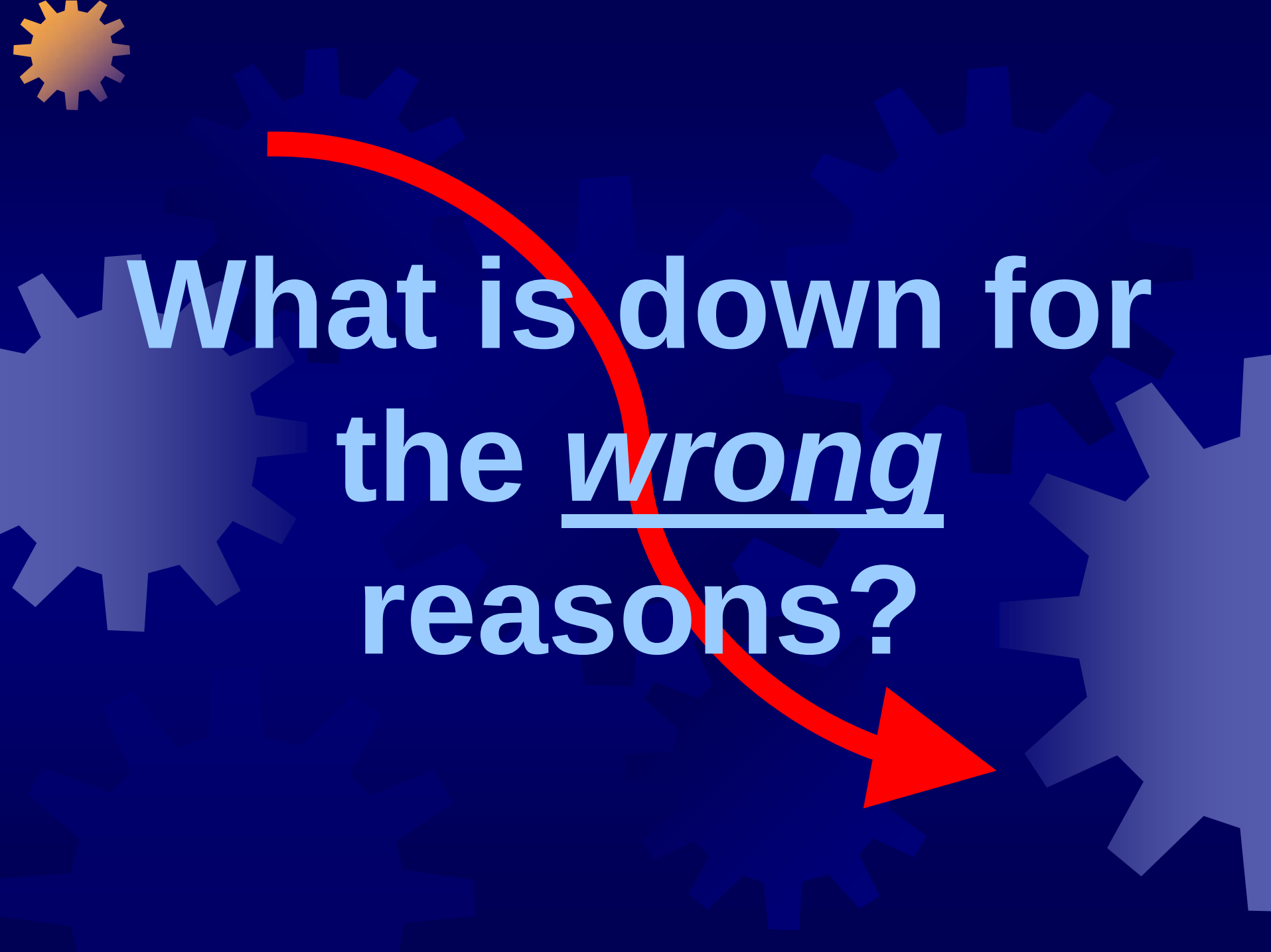
Why *Aren't* Falls a Priority?

Falls are the leading cause of injury, institutionalization, and loss of independence among older adults

Perceived Risk
vs.
Risk Realities

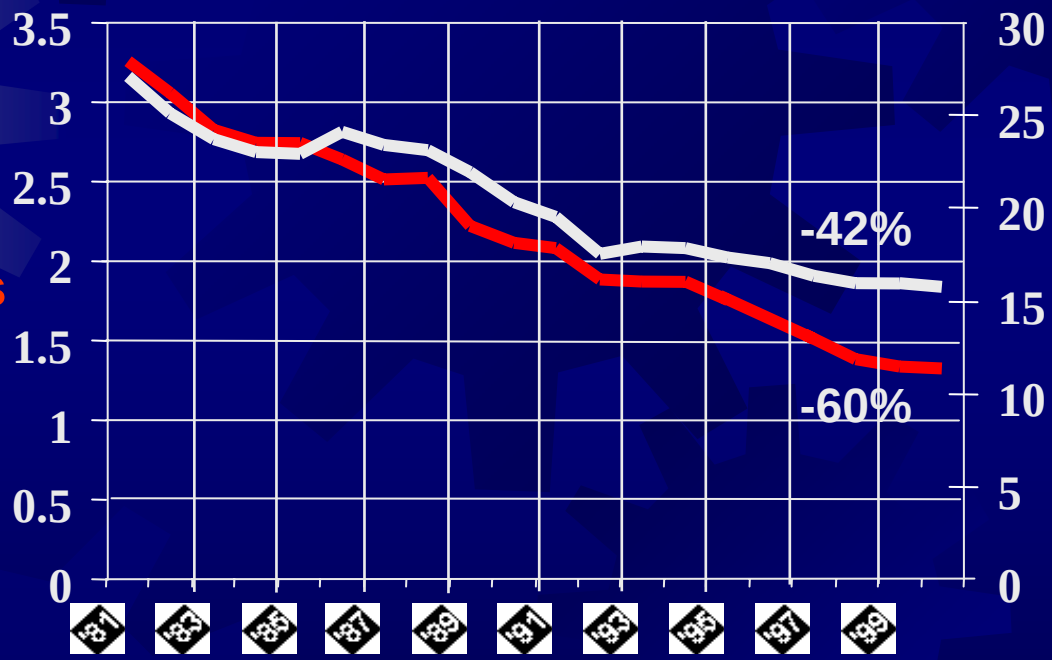
Hospitalized Injuries Due to Falls Vs. Motor Vehicle Traffic, Age 55 +, California, 2004




What is down for the wrong reasons?

Childhood Pedestrian Rates, per 100,000, Ages 0-19 years, United States

Pedestrians



All causes

So wait a minute . . .

how do you know which interventions to use?

Public Health Approach

Step 1: Defining your problem: use surveillance data

Step 2: Review literature for best practices

Step 3: Conduct community needs assessment

Step 4: Select Injury Priorities

Step 5: Implement Strategies

Step 6: Evaluate

Exhausted thinking about all you need to do?

Change won't happen if we don't work *together*

Build Partnerships. . .and then build some more!

Coalitions!

Maximize existing resources

Integrate injury prevention into other (non-injury) programs

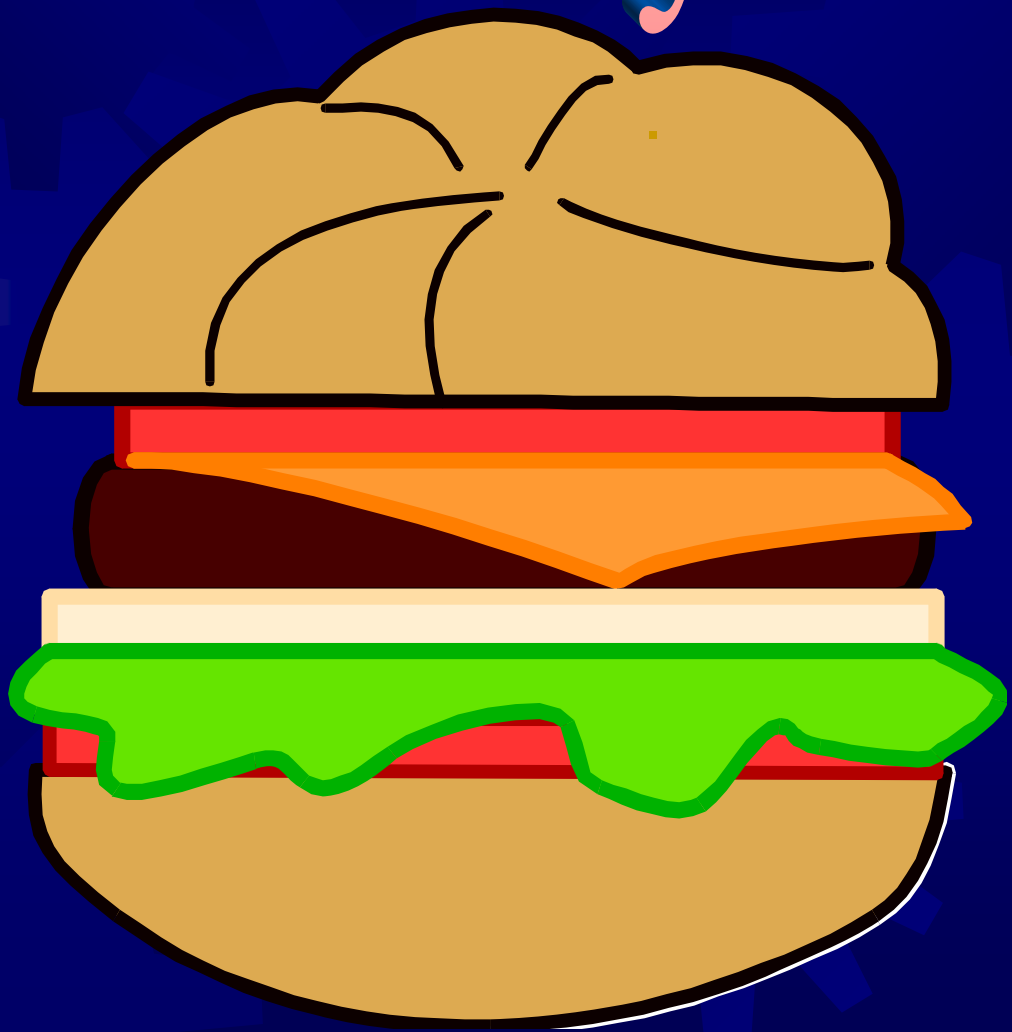
What's In It for Them?

- Both sides taking a risk
- Find ways to help others succeed
  - Support activities that will help them (and us!) to shine

A Local Example:

SIPP (Alameda) Pilot Project - When Fremont Fire responds to a 911 fall w/o injury, refers elder to an agency with senior social services (case manager) who then provides fall prevention information

The Obesity Epidemic



What are the"most promising approaches?"

Shifting people from cars to…

- **walking**
- **bicycling**

Journal of the
American Medical Association
October 1999

Can't just tell folks to go out and walk if it isn't SAFE, interesting, and easily accessible

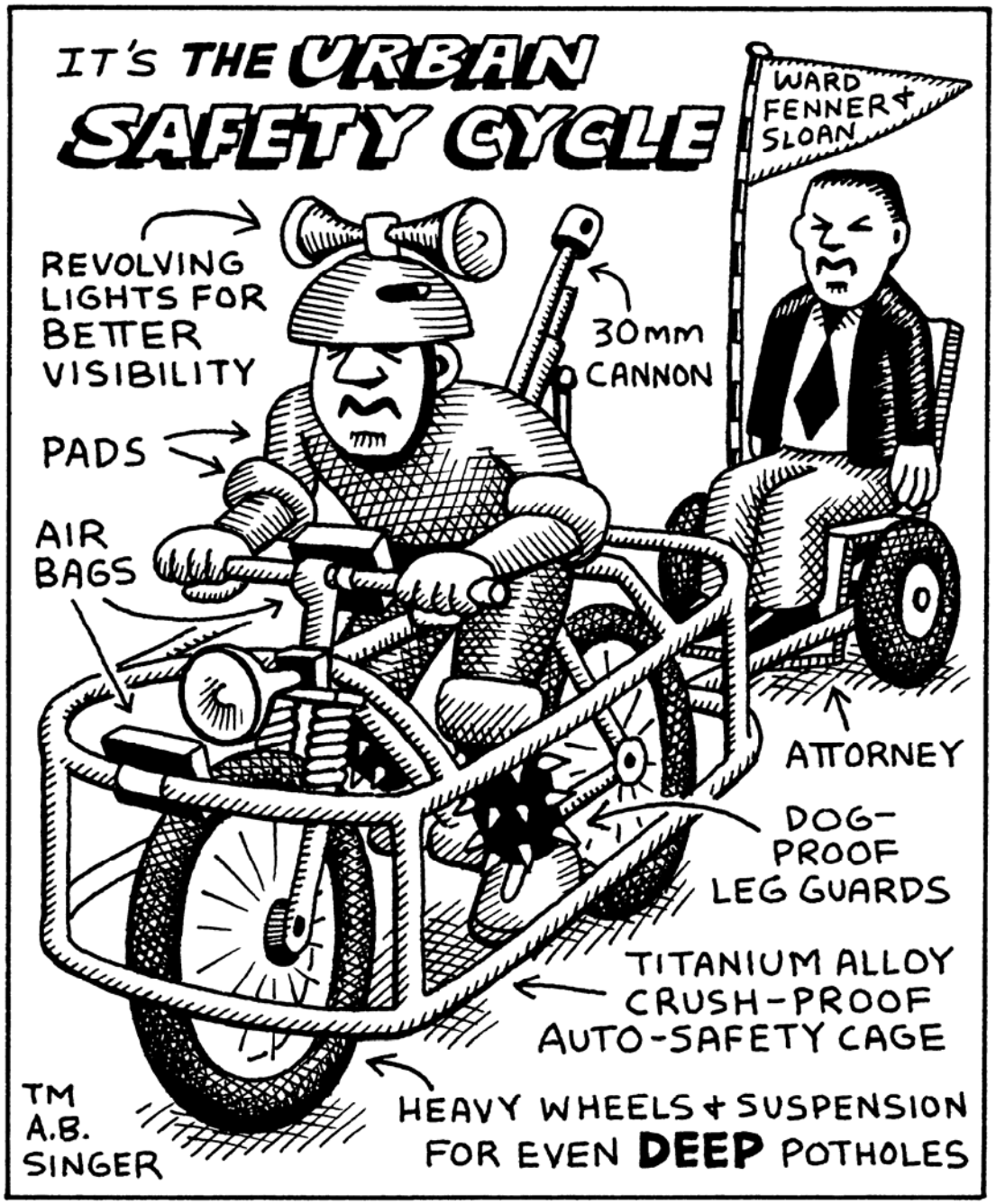
Role for injury prevention in walkable neighborhoods and larger-scale smart growth!

Often the "carrot" in discussing public health angle with transportation engineers or in discussing violence prevention with urban planners

In Summary?

If we're creative and work together, who knows what we can accomplish next!

NO EXIT © Andy Singer



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